



Unit 17 Denmore Industrial Estate, Denmore Road, Bridge of Don, Aberdeen AB23 8JW

User Manual Grease Head

This Manual Covers the Following Part Numbers:

145-3297-HV0

145-3727-HV0



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Revision History

Issue, Release Date	Description
Rev A, 20 Apr. 10	Initial Issue
Rev B, 12 Sept 10	Addition of GIH Pt No 145-3727 HV0
Rev C, 14 Oct 10	Update of Configuration Information
Rev D, 03 Dec 10	Pt No Update for Packing Gland

Safety

WARNING: Trapped air requires considerable time to compress and when it is compressed is highly dangerous. It has enough stored energy to separate parts with considerable force.

All pressure equipment has a particular pressure rating and care must be taken to ensure that no item is used in a situation that may cause its working pressure to be exceeded.

All personnel involved in pressure testing must be formally trained, competent and utilising the appropriate PPE.

Safe-Lok devices, where fitted, should be checked for positional security to avoid unnecessary movement of the collar

Ensure the identification band/plate is fitted and is displaying the correct information as per the Tag Sheet/Index

This equipment and the equipment it is attached to is heavy never position yourself below a suspended load



Figure 1: Grease Head Safety

Finger, Glove and
loose clothing trap
area



1 Introduction

1.1 General

Phuel has transformed the greasehead functionality with the innovation of using what are essentially small quick union connections on the flow tube housings. This vastly improves, eases and speeds up the redressing operations and allows the operator to align his hydraulic connection with ease. The design utilises standard flow tubes and comes complete with ball check valves and chemical injection facilities. The Phuel greasehead is designed for up to 10,000psi working pressure, 15,000psi test pressure H2S service. Higher working pressures can be obtained if required

This user manual serves as an introduction to the equipment and contains the relevant specifications, operation, planning and maintenance instructions, parts list and drawings.

1.2 Product Identification

Phuel products are identified by a unique serial number that facilitates full product traceability. Each product is supplied with a documentation pack that contains product certification and material/inspection reports. The serial number is always etched on the surface of the product but can sometimes be difficult to find or read after painting. A customer identification number is also included to allow the customer to track the asset in their system.

A stainless steel band secures the nameplate tag that is stamped with the information shown below. This tag should be located in the first instance to ensure that this manual refers to the correct equipment.

PHUEL OIL TOOLS LTD
DESCRIPTION & SIZE
CUSTOMER ID No
PHUEL ID No 06-XXX-XX
MWP & SERVICE
TEST DATE

2 Technical Specification

Part Number	145-3297-HH0	145-3727-HV0
Connections	5 ¾" Otis Type 2" NPT Male Top Thread	
Maximum Working Pressure	10,000 Psi	
Design Test Pressure	15,000 Psi	
Service	H2S	
Weight	318 lbs / 144 kg	
Overall Length (A)	133.3" / 3.39m	
Make Up Length (B)	129.4" / 3.29m	

Table 1:Technical Data

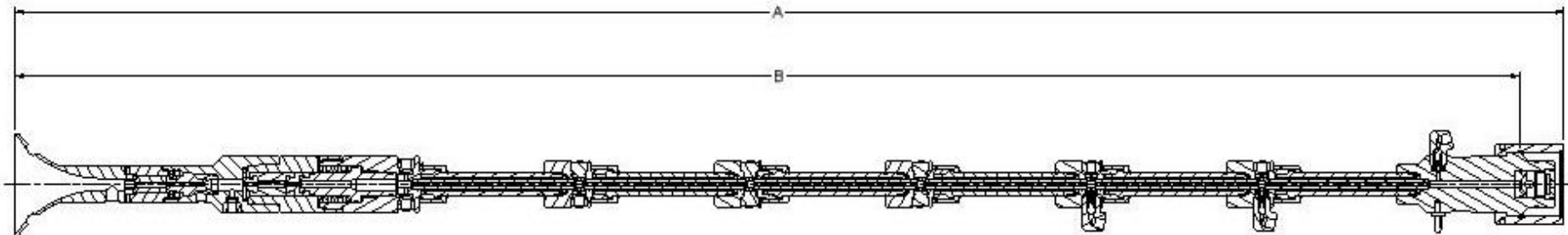


Figure 2: Grease Head

3 Technical

3.1 Description

The grease injection control head (greasehead) provides a pressure seal around stationary or moving wireline that is run into or out of wells to prevent the escape of well fluids to the environment. The assembly consists of a hydraulic pack off and a series of flow tube assemblies.

The flow tube assembly consists of a number of close fitting steel tubes through which the wire line passes. Each flow tube is approximately 14" long and these are slipped onto the wire and connected together with the fast collar connection to build up the required length. Viscous grease is injected between the bore of the flow tube and the outside of the wire and travels along the length of the flow tube stack creating a pressure drop. Grease injection pressure can then be increased to about 25% more than the well pressure to create a liquid seal that allows the wire to move but prevents the escape of well fluids. The inside diameter of the flow tubes needs to be from 0.003" to 0.008" larger than the actual wire diameter for the seal to be effective so the flow tubes must be selected based on the wire being used.

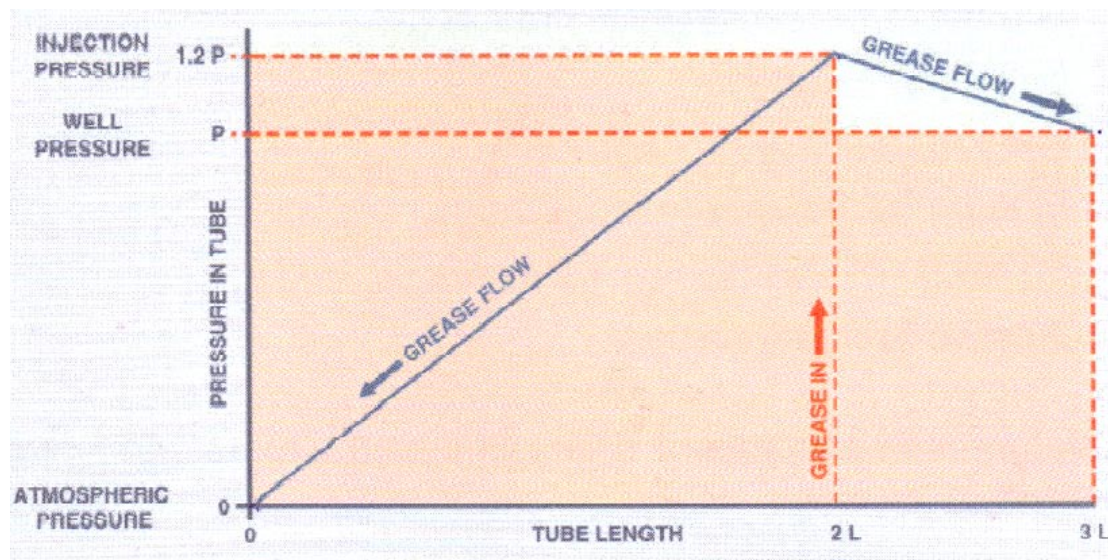


Figure 3: Pressure gradient inside the flow tube assembly

The length of flow tube required depends on the well pressure, the wire size, the flow tube size, the grease viscosity and pump rate and the effectiveness of the seal will depend on the pull out speed of the wire. The relationship for the pressure drop can be expressed mathematically by Couettes flow equation. This shows that the clearance between the wire and the flow tube has a great

effect on the pressure drop created as so this is the most important parameter to consider.

Figure 4: Couettes flow equation

The actual diameter of the wire must be measured and recorded to allow the correct diameter of flow tube to be selected. The condition of the wire must also be considered as mud or rust ingress can cause the wire to swell. Consideration also needs to be given to the wear of the flow tubes as these tend to wear in the middle, where it is most difficult to measure the bore.

The grease is injected above the first flow tube and exits after the last one. Since the grease is continuously moving and some is being lost to the well, the injection process is continuous and in order to create sufficient flow rate it may be necessary to inject at two locations depending on the well pressure. The table below shows the recommended greasehead arrangement depending on the well pressures. This is a guideline only.

Well Pressure	Fluid	No of flow tubes*	No of Injection Points
0-5000 psi	Liquid	4	1
0-5000 psi	Gas	5	1
5-10,000 psi	Liquid	6	1
5-10,000 psi	Gas	7-8	1
10-15,000 psi	Liquid	10	2
10-15,000 psi	Gas	11-12	2
* including the flow tubes below the grease injection port(s)			

Table 2: Flow Tube Requirements

3.2 Key Product Features

3.2.1 Fast Collar

The fast collar is designed to allow quick replacement of the flow tubes either due to a requirement for a line size change or for repair. The fast collar is released by unscrewing the collar from the connector sub, which bears against the circlip to pull the seal out of the bore - allowing access to the flow tube housing and the flow tube. This results in a fast and easy method of configuring the greasehead and allows the injection and return ports to be orientated as required.

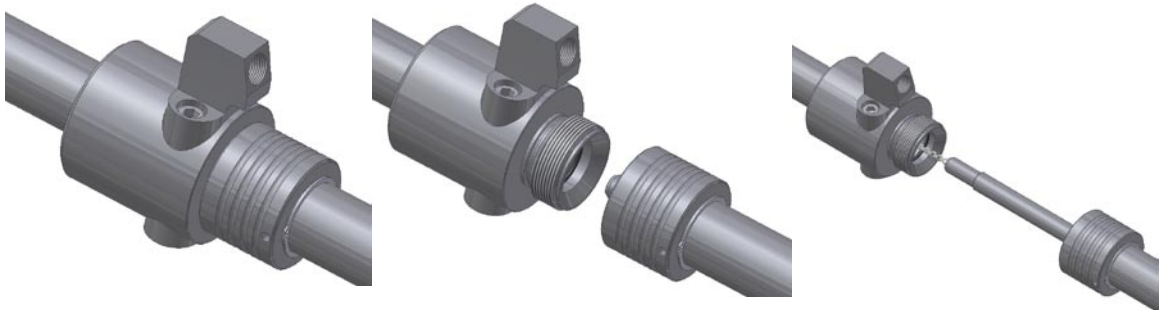


Figure 5: Fast Collar

3.2.2 Dual Ported Connector Sub

The Connector Subs between each of the flow tube housings has two opposing saver sub ports. Depending on the Saver Sub fitted these can either be blanked off or used for pressure monitoring in between each flow tube if required. This provides maximum operational flexibility

3.2.3 Check Valve Saver Sub

The saver sub interface also allows a right angled check valve assembly to be used that angles the outlet at a suitable angle to ease the management of the hoses and provides a check valve to prevent well fluids being returned to the grease skid. These subs can be placed in any location but are normally used in the chemical injection port and the grease injection port.

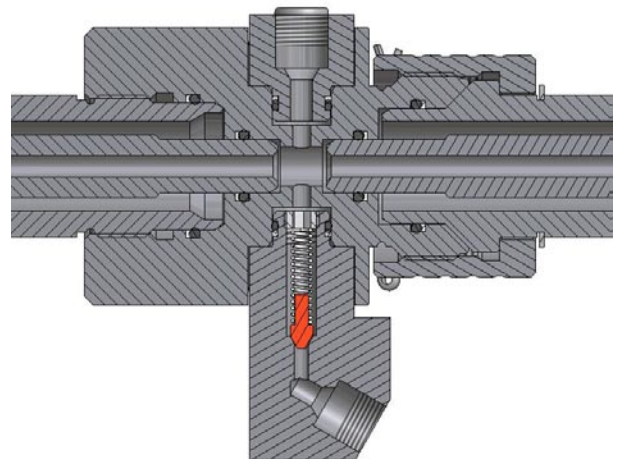


Figure 6: Dual Port Connector Sub

The check valve components can easily be removed to provide a simple right angled port that may be used on the grease return line if only one injection line is required.

3.2.4 Tension Pack off

The pack off assembly allows a rubber seal to be made against static wire in order to prevent the escape of well fluids if the grease seal is lost. In some greaseheads the packing can become energised by the flow of the grease and can cause it to grip down on the wire and prevent or restrict the running of the wire. The Phuel pack off element is located at both ends and is held in tension to prevent this kind of problem from occurring.

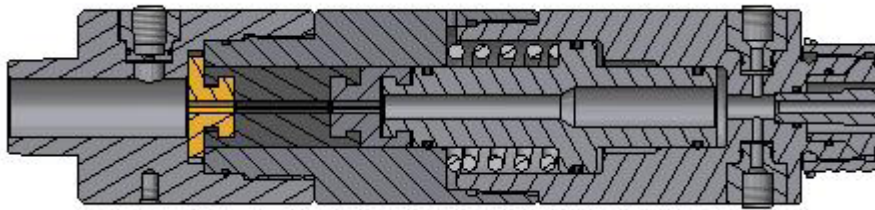


Figure 7: Tension Pack Off

3.2.5 Air Line Wiper

The Phuel Air Line Wiper allows easier handling and wire protection due to the smaller bell housing and its internal curvature. With a standard airline connected the internal jet system produces a curtain of air which retains the grease and wipes the wire removing almost 100% of the grease. The bell housing also contains a drain hole which is usually plugged but is available to be used to drain off any residual grease.

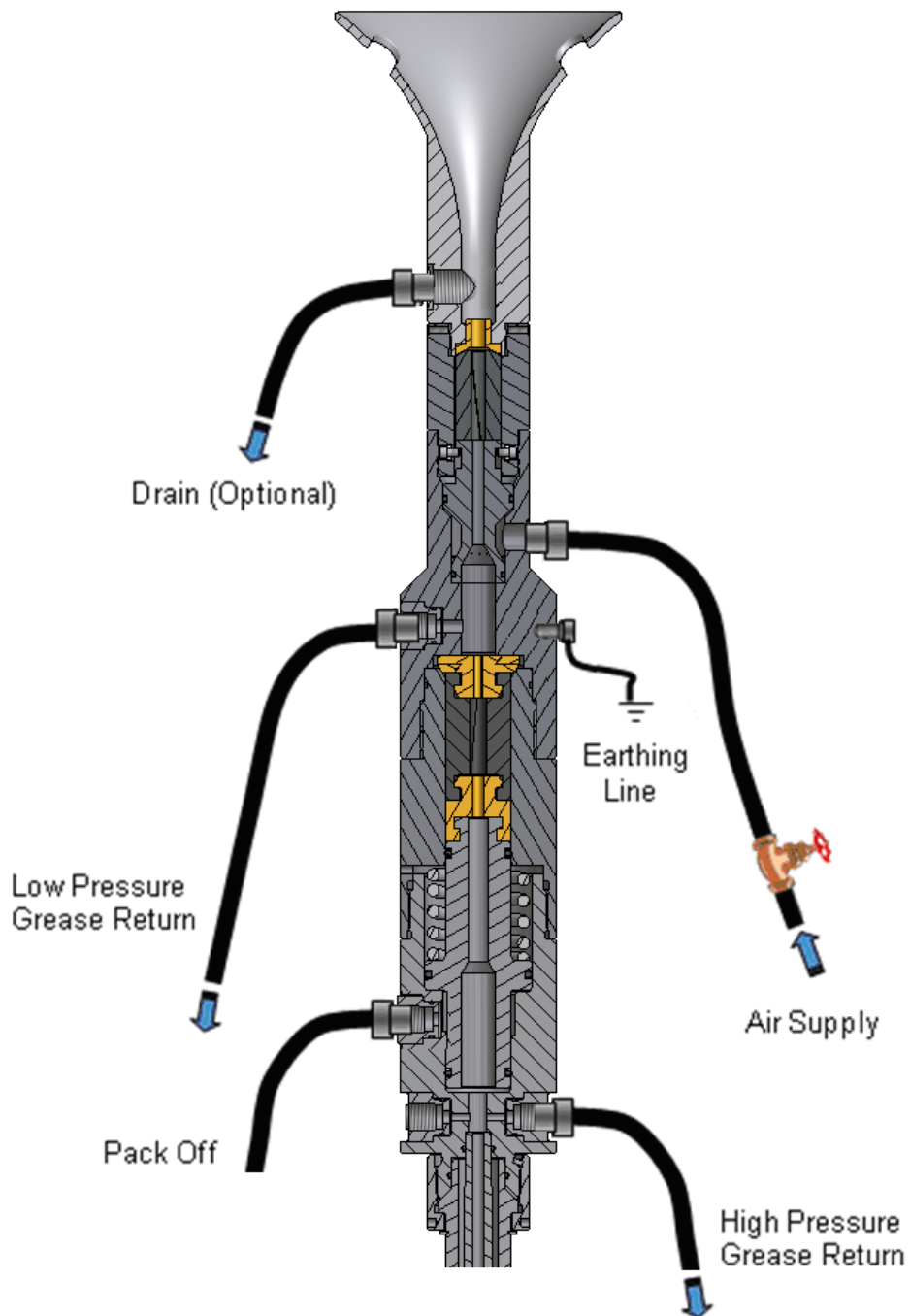


Figure 8: Air Line Wiper Setup

3.2.6 Lower Pack off Option

As an option there is a lower pack off assembly that can be attached below the lower flow tube to provide a lower pack off assembly. This can be used to quickly re-establish the grease seal during operations rather than circulating the grease all the way to the BOP.

The lower pack off would be closed with the upper one and grease circulated through only the greasehead length without any losses in to well below. This will provide a smaller volume for circulation and may eliminate the need to close BOP on the wire – thus saving valuable operational time.

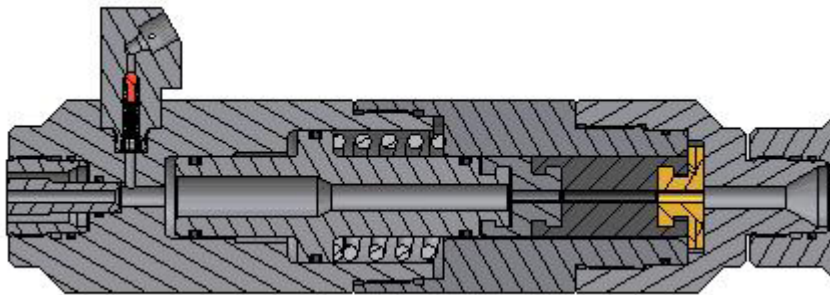


Figure 9: Lower Pack off (Option)

3.2.7 Hose Tie-off Hook

A tie-off hook is provided in the bottom sub to allow the hoses that hang from the greasehead to be secured and tied together. This improves the hose management when lifting the greasehead into position.

This hook is not intended to be used for the lifting the greasehead. Do not apply lifting loads at this point.



Figure 10: Tie-off Hook

4 Operation

All operations to be carried out by suitably qualified and competent personnel

4.1 Lifting and Handling

Thread protectors should always be fitted when lifting or moving the greasehead.

4.1.1 Vertical

The greasehead should be lifted with a suitable lifting clamp or sling that is rated for the total lifting load. Following the instructions for the clamp or sling being used.

If practical leave the thread protectors fitted until ready to make up the connections.

4.1.2 Horizontal

Suitable slings can be wrapped around either end of the greasehead to allow horizontal lifting for means of transportation or fitting. Always pay attention to the centre of gravity and do not continue to lift if the greasehead is not sitting horizontal as it might slip through the slings.

4.2 Pre Job

- Ensure thread protectors are fitted
- Check maintenance record sheet and ensure the equipment has been maintained by competent personnel
- Check all certification is in date
- Confirm information band is fitted and correct
- Ensure equipment is suitable for the maximum working pressures and services involved
- Ensure visible 'O' rings are seated correctly and there are no signs of damage
- Ensure threads are clean
- Inspect for signs of damage
- Pressure test to maximum operating pressure

4.3 During Job

- Select the correct size of flow tubes according to the actual wire sizes for the wire being used.
- Insert the wire as shown in the following diagram
- Rig up the hoses according to the diagram

4.3.1 Replacing the Saver Sub

It is not expected that the saver sub would need to be replaced during normal operations but if damage occurs to a pressure fitting or a leak is found during pressure testing then this procedure should be followed.

- Ensure that the pressure is bled off.
- Do not remove the pressure fittings at this time as they can be used to provide grip to remove the plug.
- Remove the two socket head cap screws and lock washers. (If they appear unusually tight or difficult to move re-check that the pressure has been removed).
- Grip the pressure fitting and pull out the saver sub with a pulling and rocking motion. If the pressure fitting has been removed already then two ¼-20 UNC screws (not supplied) can be used to jack out the sub.
- Inspect the o-ring for signs of damage and replace if necessary
- Inspect the seal bore for signs of damage and report if necessary
- If required, remove the pressure fitting – clean and inspect the pressure port.
- To re-fit the sub apply grease to the o-ring and seal bore.
- Push the sub into the bore by hand as far as possible, ensuring that the part is centralised in the bore.
- Fit the screws and washers and tighten to drive the o-ring into the bore. Make up each screw equally to ensure that the sub does not become twisted.
- Fully tighten the screws.

4.3.2 Removing the Check Valve Components

This will be required if the injection Check Valve Saver Sub is being moved to the return port to provide a right angled port. The check valve can be re-instated by following the procedure in reverse.

- With the check valve sub removed from the body
- Unscrew the Hollow Hex Plug using a suitable hex key
- Remove the spring and check valve and store in a safe place
- Replace the Hollow Hex Plug to act as a thread protector
- Refit the Check Valve sub to the required port.

4.3.3 Configuring to suit the wire

The Phuel greasehead is multi-line and so no special parts changes are required to suit the diameter of the wire being used. Only the line wiper module needs to be changes to ensure that the wiper works effectively.

The table below shows the parts that should be fitted for the range of wire sizes.



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Wire	Interlocking Seats	Split Packing	Packing Gland	Air Nozzle	Wire Guide	Line Wiper Packing Stick
Item No *	20	21	40	55	57	59
Qty	1 off each	2 off each	1 off set	1 off	2 off each	2 off each
3/16	145-3236-W43 (LEFT) & 145-3237-W43 (RIGHT)	145-2969-PU8	145-2970-W43	147-3361-W19	147-3365-W19	147-3464-W31
7/32				147-3361-W21	147-3365-W21	
1/4				147-3361-W25	147-3365-W25	
5/16				147-3361-W31	147-3365-W31	
3/8				147-3361-W38	147-3365-W38	147-3464-W43
7/16				147-3361-W43	147-3365-W43	
15/32	145-3236-W47		145-2970-W47	147-3361-W47	147-3365-W47	147-3464-W47

* - Refers to drawing shown in Section 7.

Table 3: Configuring to suit the wire

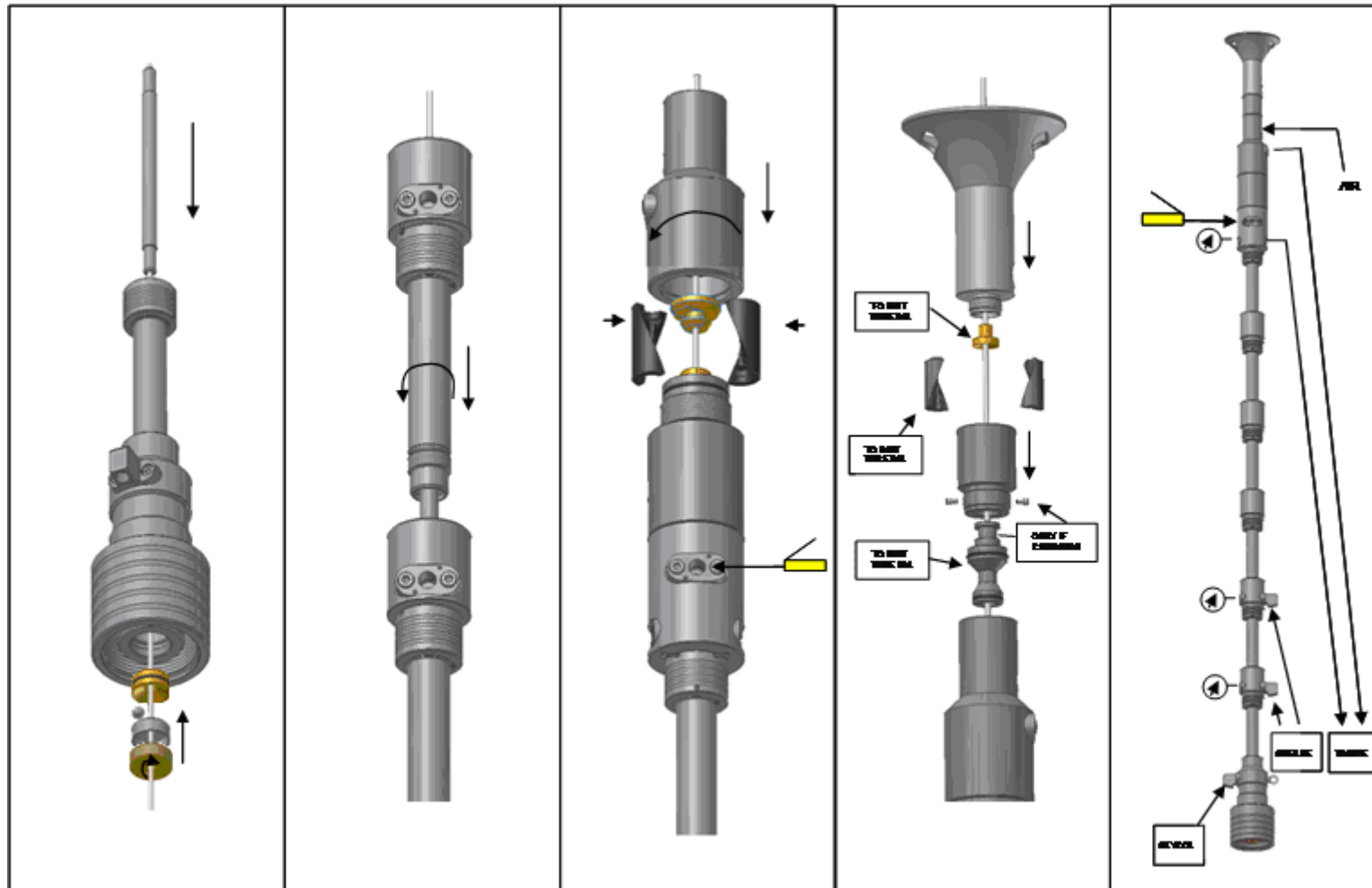


Figure 11: Greasehead Setup

4.4 Post Job

- Inspect for signs of damage
- Ensure threads are clean
- Ensure thread protectors are fitted

5 Maintenance

All maintenance to be carried out by suitably qualified and competent personnel

5.1 Introduction

Regular maintenance of the equipment using Phuel redress kits or Phuel approved parts is essential to its continued safe operation. Ensure that the pre and post job operating procedures are followed and that maintenance records are kept.

5.2 Schedule

The maintenance schedule may be governed by international or company standards and the following is considered to be the minimum requirements.

5.2.1 Pre & Post Job

Refer to Section 4.2 and Section **Error! Reference source not found.** for details

5.2.2 Yearly

- Disassemble Greasehead (see 5.5.1) clean and degrease all components
- Inspect the condition of all sealing surfaces and surface coatings
- Re-coat threads and sealing surfaces if necessary. If in doubt contact Phuel Oil Tools Ltd
- Replace all elastomeric seals with items from redress kit (see spares Table 7)
- Regrease components
- Re-assemble (see 5.5.2)
- Pressure test to maximum working pressure in accordance to testing procedure (see 6)
- Inspect paint work and repair as necessary

5.2.3 Five Yearly

- Yearly Maintenance (plus the following)
- Carry out 100% surface NDE on all surfaces
- Pressure test to test pressure witnessed by certifying authority

5.3 Safety

- Ensure all pressure testing is carried out in the appropriate testing area by suitably qualified personnel.
- Wear appropriate personal protective equipment.
- Do not over exert yourself while using torque wrenches. Use appropriate mechanical advantages when available.
- Ensure that all tools and equipment are in good condition and are suitable for the intended use.
- Clear up any fluid spills immediately to avoid slips.

5.4 Tools

The following tools are required:

- Memac Chain Wrench (No2 with 14" chain)
Other pipe wrenches may be used but will mark equipment
- 3/8 hex Allen key
- 7/8" Spanner (If NPT Plug to be fitted)
- Wire Brush

5.5 Redress Procedure

5.5.1 Dis-Assembly

- Remove the packoff assembly by unscrewing the uppermost Fast Collar (6)
- Remove the Top Sub (1) and strip off the Saver Sub assembly
- Pump up the piston and remove the Interlocking seats (20 & 21)
- Remove the split Packing (22) and Packing Gland (40)
- Bleed off the piston pressure and disconnect the pump
- Remove the Seal Housing (2) and collect the spilled hydraulic fluid
- Remove the Spring (41)
- Remove the Piston (4)
- Remove all the Saver Sub assemblies from the Return Housing

- Remove the Flow Tube Housing (7) from the next Connector Sub (5)
- Strip off the Saver Sub assemblies from the Connector Sub
- Remove the Flow Tube if fitted
- Remove the Circlip (43) and remove the Fast Collar (6)
- Repeat this process until all Housings are removed

- Remove the Check valve port from the Bottom Sub
- Remove the Collar
- Remove the Retaining Ring (24), Ball Cup (25) and Ball (42)
- Remove the Check Valve Seat (23)

- Remove all seals from the individual components without damaging the surface of the sealing groove. Only do this if new seals are being fitted – otherwise leave the seals as they are and inspect for signs of damage or wear.

5.5.2 Re-Assembly

Re-assembly is the reverse to dis-assembly

- Ensure fresh seals are used from a redress kit and verify that the expiry date has not been exceeded
- Inspect all seal grooves and bores for signs of scratches. Clean up if required with fine emery cloth
- Fit the seals avoiding excessive stretch and lightly coat with grease

5.6 Maintenance Record Sheet

Date Performed	Type of Maintenance	Performed By	Verified By	Comments

Table 4: Maintenance Record

6 Testing

All testing is to be carried out in the designated test area and by suitably qualified and competent personnel.

WARNING: Trapped air requires considerable time to compress and when it is compressed is highly dangerous. It has enough stored energy to separate parts with considerable force.

- Fit appropriate test caps and blanking plugs. No flow tubes are required for a body test
- Fill with testing fluid bleeding off any air within the system
- Apply a pressure of 500 psi and ensure pressure holds for a minimum of 10 minutes
- Increase pressure to 10,000 psi (Maximum Working Pressure), allow to stabilise and maintain this pressure until it is evident there are no apparent leaks. (Testing to be carried out to Test pressure when decreed by maintenance schedule)
- Bleed off pressure, drain test fluid and dry
- Remove test caps
- Apply coating of de-watering solution to protect the bore and threads
- Fit thread protectors and shipping cap plugs

On completion of all maintenance ensure the maintenance record sheet (Para 5.6) is completed

7 Parts List and Drawings

Item Number	Part Number	Quantity	Description
1	147-3363-480	1	LINE WIPER HOUSING
2	145-2971-480	1	SEAL HOUSING
3	145-2974-480	1	RETURN HOUSING
4	145-2966-480	1	PISTON
5	145-2975-480	5	CONNECTOR SUB
6	145-2120-480	6	FAST COLLAR
7	145-2121-480	6	FLOW TUBE HOUSING
8	145-2123-480	1	BOTTOM SUB
9	175-3341-480	1	5-3/4 SOLID COLLAR (DW STYLE)
10	145-2176-480	6	SAVER SUB 1/2" NPT
11	205-2105-480	5	BLANK TEST PORT
12	900-3019-480	3	CHECK HOUSING
13	145-3248-480	1	SAVER SUB (10MM HOLE)
20	145-3236-W43	1	INTERLOCKING SEAT - LEFT
21	145-3237-W43	1	INTERLOCKING SEAT - RIGHT
22	145-2969-PU8	2	SPLIT PACKING
23	145-2126-B21	1	CHECK VALVE SEAT
24	145-2128-B21	1	RETAINING RING
25	145-2127-PTF	1	BALL CUP
29	802-2977-H80	2	PISTON T-SEAL (2.00)
30	802-2183-H80	1	PISTON T-SEAL (3.250)
31	801-0119-V90	15	O-Ring - B.S Size 119
32	801-0210-V90	12	O-Ring - B.S Size 210
33	801-0223-V90	6	O-Ring - B.S Size 223
34	801-0224-V90	6	O-Ring - B.S Size 224
35	801-0225-V90	2	O-Ring - B.S Size 225
36	801-0234-V90	1	O-Ring - B.S Size 234
37	801-0342-V90	1	O-Ring - B.S Size 342
40	145-2970-W43	1	PACKING GLAND
41	145-2177-STL	1	PISTON SPRING
42	145-2181-316	1	BALL BEARING 0.750 DIA
43	145-2180-STL	6	EXTERNAL CIRCLIP (DSH-50)
44	190-1749-STL	3	COMP SPRING (C6615650)
45	190-2786-PEK	3	CHECK CONE SEAL
46	190-1703-STL	3	Hollow Lock Screw 3/4-16 (MAC-765)
47	SHC-0583-3A4	30	Soc Hd Cap Size 1/2 Length 0.75 in
48	WNL-0580-304	30	WASHER NORDLOCK (M12)
49	950-3524-STL	1	SHOULDER EYE BOLT (1/2 UNC)
50	145-2215-304	6	SPLIT COTTER PIN 1/8 X 3" LONG
55	147-3361-W31	1	AIR NOZZLE (DW STYLE)
56	147-3362-480	1	PACKING HOUSING
57	147-3365-W31	1	WIRE GUIDE (DW LINE WIPER)



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Item Number	Part Number	Quantity	Description
58	147-3364-316	1	FUNNEL (DW STYLE)
59	147-3464-W31	1	LINE-WIPER PACKING STICK
61	SHC-0502-3A4	2	Soc Hd Cap Size 1/4 Length 0.375 in
62	801-0220-V90	1	O-Ring - B.S Size 220
63	WNL-0500-304	2	Nordlock Washer size 1/4
100	910-3541-N66	1	DW MALE PROTECTOR 5-3/4

Table 5: Parts List 145-3297-HH0

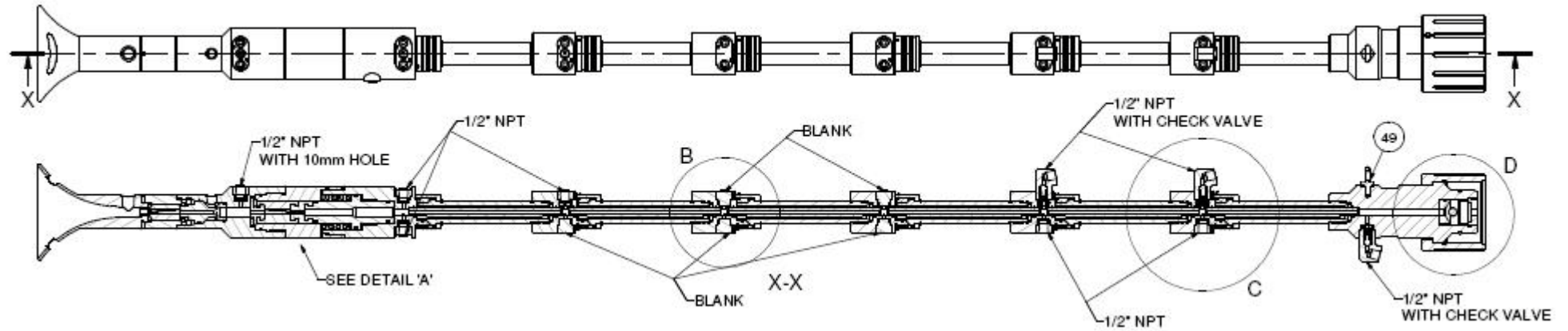
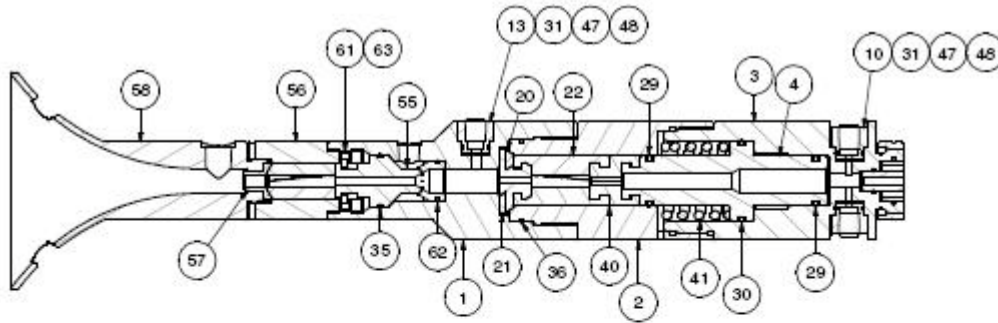
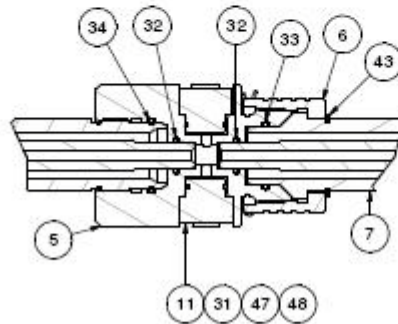


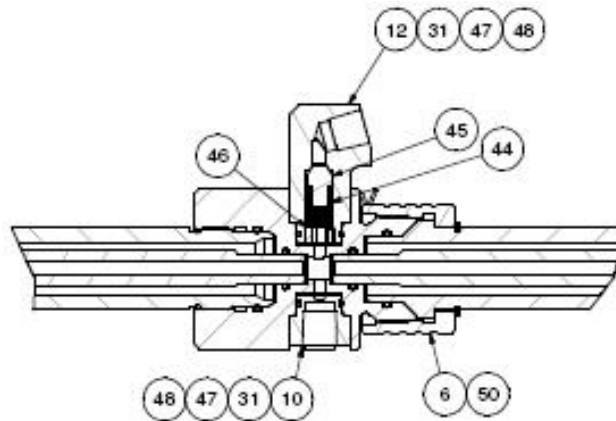
Figure 12: Grease Head Assembly 145-3297-HH0



DETAIL 'A'



DETAIL 'B'



DETAIL 'C'

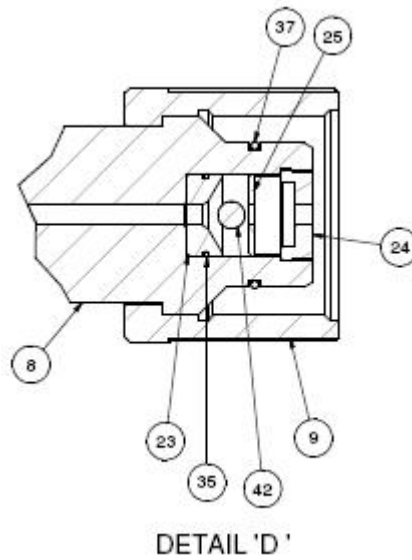


Figure 13: Grease Head Detail Assembly 145-3297-HH0



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Grease Head

Item Number	Part Number	Quantity	Description
1	147-3363-480	1	LINE WIPER HOUSING
2	145-2971-480	1	SEAL HOUSING
3	145-2974-480	1	RETURN HOUSING
4	145-2966-480	1	PISTON
5	145-2975-480	2	CONNECTOR SUB
6	145-2120-480	6	FAST COLLAR
7	145-2121-480	6	FLOW TUBE HOUSING
8	145-2123-480	1	BOTTOM SUB
9	175-3341-480	1	5-3/4 SOLID COLLAR (DW STYLE)
10	145-2176-480	5	SAVER SUB 1/2" NPT
11	145-3665-480	3	BLANK CONNECTOR SUB
12	900-3019-480	3	CHECK HOUSING
13	145-3248-480	1	SAVER SUB (10MM HOLE)
20	145-3236-W43	1	INTERLOCKING SEAT - LEFT
21	145-3237-W43	1	INTERLOCKING SEAT - RIGHT
22	145-2969-PU8	2	SPLIT PACKING
23	145-2126-B21	1	CHECK VALVE SEAT
24	145-2128-B21	1	RETAINING RING
25	145-2127-PTF	1	BALL CUP
29	802-2977-H80	2	PISTON T-SEAL (2.00)
30	802-2183-H80	1	PISTON T-SEAL (3.250)
31	801-0119-V90	9	O-Ring - B.S Size 119
32	801-0210-V90	12	O-Ring - B.S Size 210
33	801-0223-V90	6	O-Ring - B.S Size 223
34	801-0224-V90	6	O-Ring - B.S Size 224
35	801-0225-V90	2	O-Ring - B.S Size 225
36	801-0234-V90	1	O-Ring - B.S Size 234
37	801-0342-V90	1	O-Ring - B.S Size 342
40	145-2970-W43	1	PACKING GLAND
41	145-2177-STL	1	PISTON SPRING
42	145-2181-316	1	BALL BEARING 0.750 DIA
43	145-2180-STL	6	EXTERNAL CIRCLIP (DSH-50)
44	190-1749-STL	3	COMP SPRING (C6615650)
45	190-2786-PEK	3	CHECK CONE SEAL
46	190-1703-STL	3	Hollow Lock Screw 3/4-16 (MAC-765)
47	SHC-0583-3A4	18	Soc Hd Cap Size 1/2 Length 0.75 in
48	WNL-0580-304	18	WASHER NORDLOCK (M12)
49	950-3524-STL	1	SHOULDER EYE BOLT (1/2 UNC)
50	145-2215-304	6	SPLIT COTTER PIN 1/8 X 3" LONG
55	147-3361-W21	1	AIR NOZZLE (DW STYLE)
56	147-3362-480	1	PACKING HOUSING
57	147-3365-W21	1	WIRE GUIDE (DW LINE WIPER)



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Item Number	Part Number	Quantity	Description
58	147-3364-316	1	FUNNEL (DW STYLE)
59	147-3464-W21	2	LINE-WIPER PACKING STICK
61	SHC-0502-3A4	2	Soc Hd Cap Size 1/4 Length 0.375 in
62	801-0220-V90	1	O-Ring - B.S Size 220
63	WNL-0500-304	2	Nordlock Washer size 1/4
100	910-3541-N66	1	DW MALE PROTECTOR 5-3/4 (Not Shown)

Table 6: Parts List 145-3727-HV0

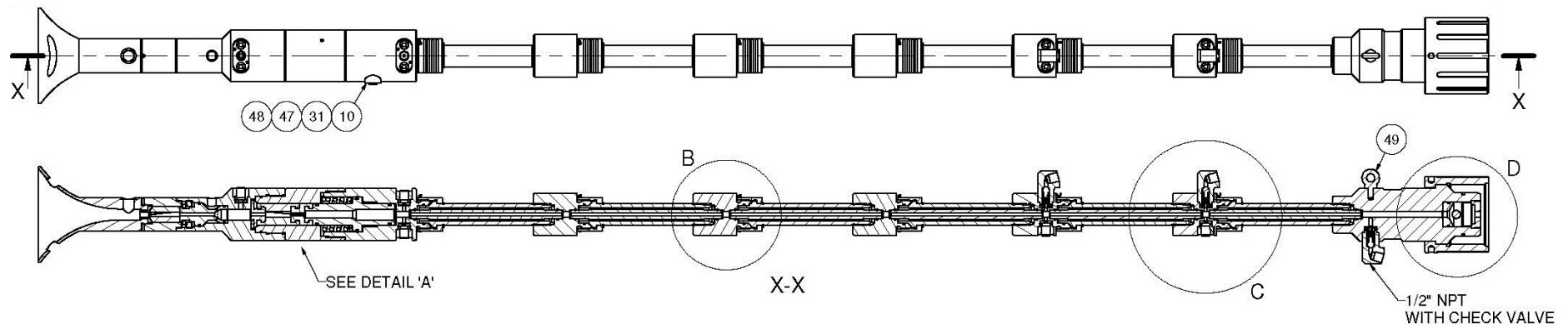
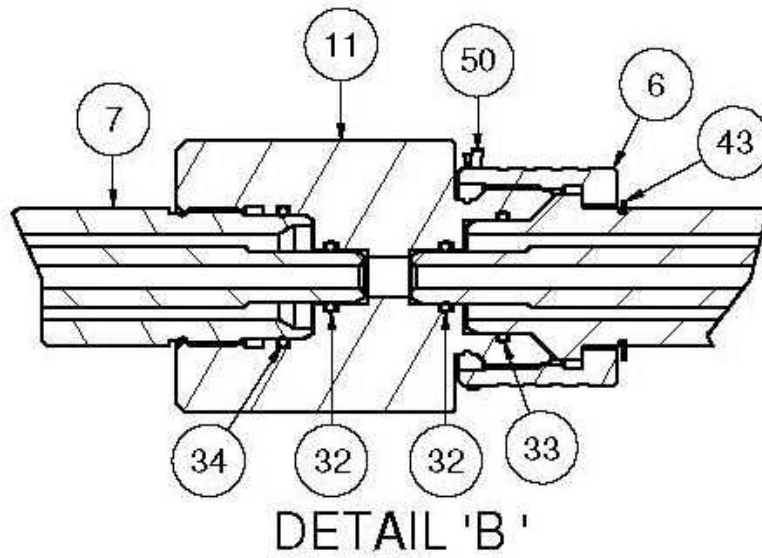
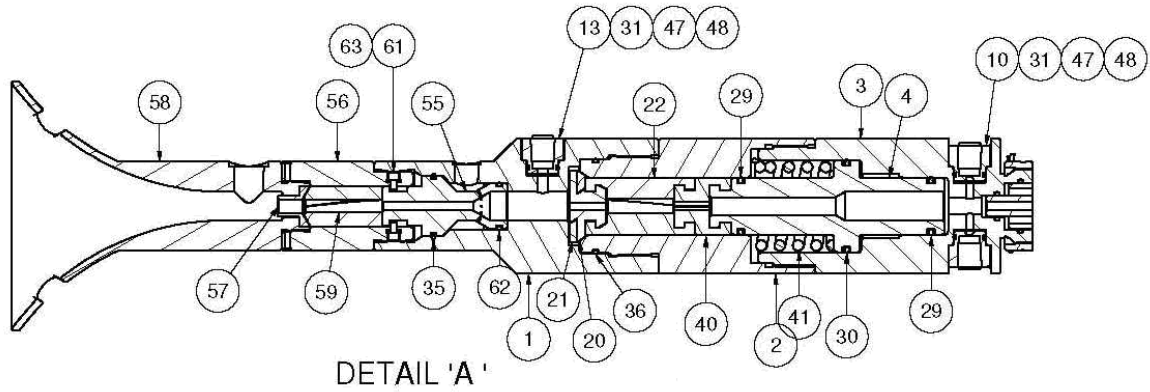


Figure 14: Greasehead Assembly Pt No 145-3727-HV0



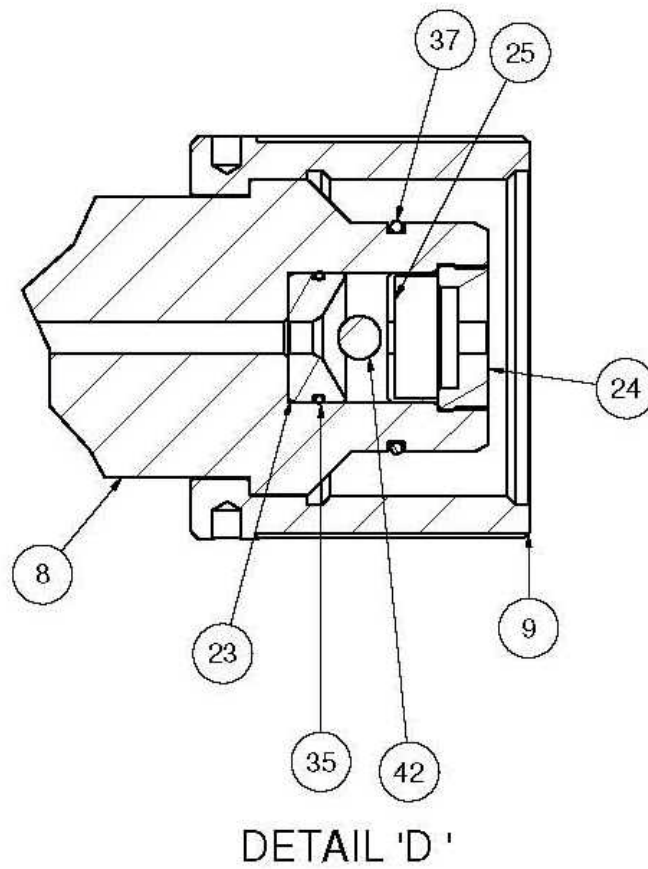
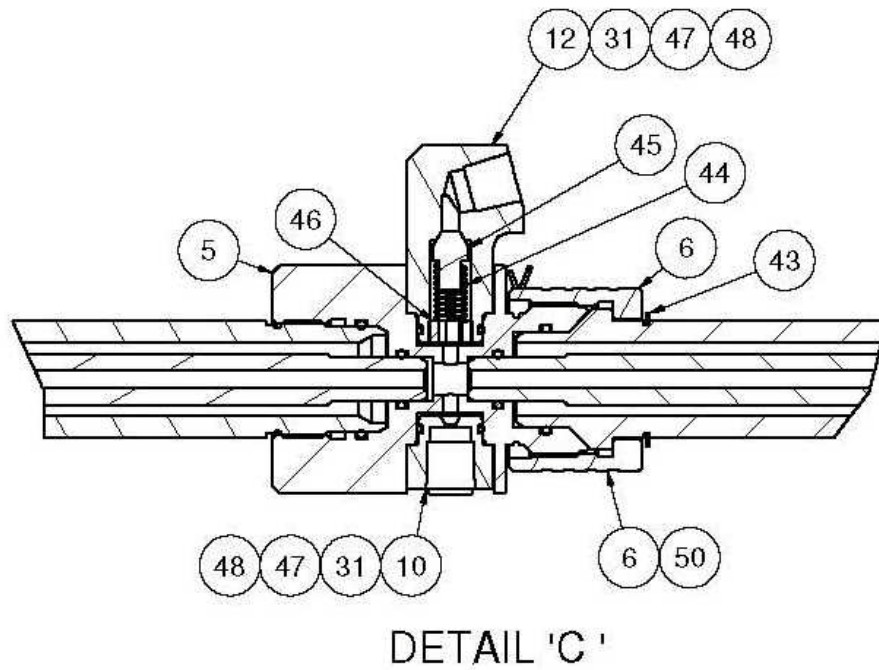


Figure 15: Greasehead Detail Assembly Pt No 145-3727-HV0

8 Spares

Use only spares supplied or approved by Phuel Oil Tools Ltd.

It is recommended that sufficient quantities of the following spares be maintained to ensure that the equipment is always available when required.

Elastomeric spares are supplied in Viton material as standard. Many other materials are available please specify when ordering.

Part No	Qty	Description
802-2977-H80	2	PISTON T-SEAL (2.00)
802-2183-H80	1	PISTON T-SEAL (3.250)
801-0119-V90	15	O-Ring - B.S Size 119
801-0210-V90	12	O-Ring - B.S Size 210
801-0223-V90	6	O-Ring - B.S Size 223
801-0224-V90	6	O-Ring - B.S Size 224
801-0225-V90	2	O-Ring - B.S Size 225
801-0234-V90	1	O-Ring - B.S Size 234
801-0342-V90	1	O-Ring - B.S Size 342
801-0220-V90	1	O-Ring - B.S Size 220

Table 7 : Redress Kit Part No RDK-3297-HV0

Part No	Qty	Description
801-0119-V90	9	O-Ring - B.S Size 119
801-0210-V90	12	O-Ring - B.S Size 210
801-0223-V90	6	O-Ring - B.S Size 223
801-0224-V90	6	O-Ring - B.S Size 224
801-0225-V90	2	O-Ring - B.S Size 225
801-0234-V90	1	O-Ring - B.S Size 234
801-0342-V90	1	O-Ring - B.S Size 342
801-0220-V90	1	O-Ring - B.S Size 220
802-2977-H80	2	PISTON T-SEAL (2.00)
802-2183-H80	1	PISTON T-SEAL (3.250)

Table 8: Redress Kit Pt No RDK-3727-HV0

8.1.1 Individual Items

Individual items may be ordered as required using the part number specified

Note: O-Rings conform to industry standards and may be substituted with those from other suppliers — **at the sole risk of the user.**

8.1.2 Supporting Equipment

The following are available for order directly from Phuel Oil Tools Ltd

Part No.	Item Description	Comments
147-2709-HV0	Air Line Wiper	To clean grease from the wire
145-2139-480	Flow Tube Size 326	With bore 0.324/0.327
145-2140-480	Flow Tube Size 335	With bore 0.333/0.336

Table 9 : Supporting Equipment

* - Other flow tube sizes are available upon request